DEFENSE INFORMATION SYSTEMS AGENCY
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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) **29 May 09**

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Tandberg Media Processing System (MPS) 800 and MPS 200 software version J4.5

References: (a) DoD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006
(c) through (e), see Enclosure 1

1. References (a) and (b) establish the Defense Information Systems Agency, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The Tandberg MPS 800 software version J4.5 is hereinafter referred to as the System Under Test (SUT). The SUT met all the critical interface and functional interoperability requirements of the Unified Capabilities Requirements Section 5.2.12.4, and is certified for joint use within the Defense Switched Network (DSN) as a Video Teleconferencing (VTC) system. The Tandberg MPS 800 was the only VTC system tested in the MPS family; however, the Tandberg MPS 200 employs the same software and video codec as the Tandberg MPS 800. JITC analysis determined the Tandberg MPS 200 to be functionally identical to the SUT for interoperability certification purposes. The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an Integrated Access Switch (IAS) or Terminal Adapter (TA), which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the Unified Capabilities (UC) Approved Products List. The SUT also met the conditional requirements for an Internet Protocol (IP) interface with the International Telecommunication Union – Telecommunication Standardization Sector (ITU-T) H.323 protocol; however, Assured Service is not yet defined for an IP interface with ITU-T H.323 protocol. Therefore, Command and Control (C2) VTC users and Special C2 VTC users are not authorized to be served by an IP interface with the ITU-T H.323 protocol. The SUT meets the critical interoperability requirements set forth in reference (c) using test procedures derived from reference (d). No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.

3. This finding is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), and Defense Information Assurance (IA)/Security Accreditation

Working Group (DSAWG) accreditation. Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 9 February through 6 March 2009. Review of the LoC was completed on 6 March 2009. DSAWG grants accreditation based on the security testing completed by DISA-led Information Assurance test teams and published in a separate report (reference (e)). DSAWG accreditation was granted on 12 May 2009. The Certification Testing Summary (Enclosure 2) documents the test results and describes the test configuration.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in Table 1.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	UCR Reference
IP (10/100 Mbps) ITU-T H.323	No [1]	Yes[2]	The VTC system/endpoints shall meet the requirements of FTR1080B-2002 (R)	Met	5.2.12.4.5
			ITU-T H.323 in accordance with FTR 1080B-2002 (C)	Met	5.2.12.4.5
			Layer 3 Differential Service Code Point tagging as specified in UCR, 5.2.12.8.2.9 (C)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics shall not degrade or impair switch and associated network operations (R)	Met	5.2.12.4.5
ISDN PRI T1 ISDN PRI E1	No [1]	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Integrated PRI interface shall be in conformance with IAS requirements in UCR, 5.2.12.7 (IAS) (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	5.2.12.4.5
Serial Interfaces[3]: EIA-366A EIA-449 EIA-530 ITU-T V.35[4]	No [1]	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	5.2.12.4.5
	Yes	Certified	Security (IA/DIACAP) (R)	See note 5.	3.2.3

Table 1. SUT Functional Requirements and Interoperability Status (continued)

NOTES:
1 The VTC system interface requirements can be met with ISDN PRI, Serial, or ITU-T H.323 interface.
2 The SUT met the requirements for the ITU-T H.323 interface standard; however, Assured Service is not yet defined for the ITU-T H.323 interface. Since ITU-T H.323 interfaces do not provide Assured Services during a crisis or contingency, users' access to the DSN will be on a best effort basis. Therefore, C2 VTC users and Special C2 VTC users are not authorized to be served by an ITU-T H.323 interface.
3 The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the Unified Capabilities (UC) Approved Products List (APL).
4 The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.
5 Security is tested by DISA-led Information Assurance test teams and published in a separate report, reference (e).

LEGEND:

C	Conditional	IAS	Integrated Access Switch
C2	Command and Control	ISDN	Integrated Services Digital Network
CPE	Customer Premise Equipment	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
DCE	data circuit-terminating equipment		
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	kbps	kilobits per second
		kHz	kiloHertz
DISA	Defense Information Systems Agency	Mbps	Megabits per seconds
DSN	Defense Switched Network	PRI	Primary Rate Interface
DTE	data terminal equipment	R	Required
E1	European Basic Multiplex Rate (2.048 Mbps)	SUT	System Under Test
EIA	Electronic Industries Alliance	T1	Digital Transmission Link Level 1 (1.544 Mbps)
EIA-366A	Standard for interface between DTE and automatic calling equipment for data communication	TA	Terminal Adapter
		UCR	Unified Capabilities Requirements
EIA-449	Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
FTR	Federal Telecommunications Recommendation	V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
H.320	Standard for narrowband VTC		
H.323	Standard for multi-media communications on packet-based networks	VTC	Video Teleconferencing
		VTU	Video Teleconferencing Unit
IA	Information Assurance		

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) System, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNet), or http://199.208.204.125 (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.

6. The JITC point of contact is Mr. Brad Friedman, DSN 879-5057, commercial (520) 538-5057, FAX DSN 879-4347, or e-mail to brad.friedman@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0821201.

FOR THE COMMANDER:

2 Enclosures a/s

for RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

Distribution (electronic mail):
Joint Staff J-6
Joint Interoperability Test Command, Liaison, TE3/JT1
Office of Chief of Naval Operations, CNO N6F2
Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)
Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ
U.S. Marine Corps MARCORSYSCOM, SIAT, MJI Division I
DOT&E, Net-Centric Systems and Naval Warfare
U.S. Coast Guard, CG-64
Defense Intelligence Agency
National Security Agency, DT
Defense Information Systems Agency, TEMC
Office of Assistant Secretary of Defense (NII)/DOD CIO
U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68
Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

(c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009
(d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
(e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Tandberg MPS family software version J4.5," 12 May 2009

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. The Tandberg Media Processing System (MPS) 800; hereinafter referred to as the System Under Test (SUT), and MPS 200 software version J4.5.

2. PROPONENT. United States Special Operations Command (USSOCOM).

3. PROGRAM MANAGER. Mr. Brian Bradway, SONC J61, 7701 Tampa Point Blvd. Macdill AFB, FL. 33621, Email: bradwab@socom.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

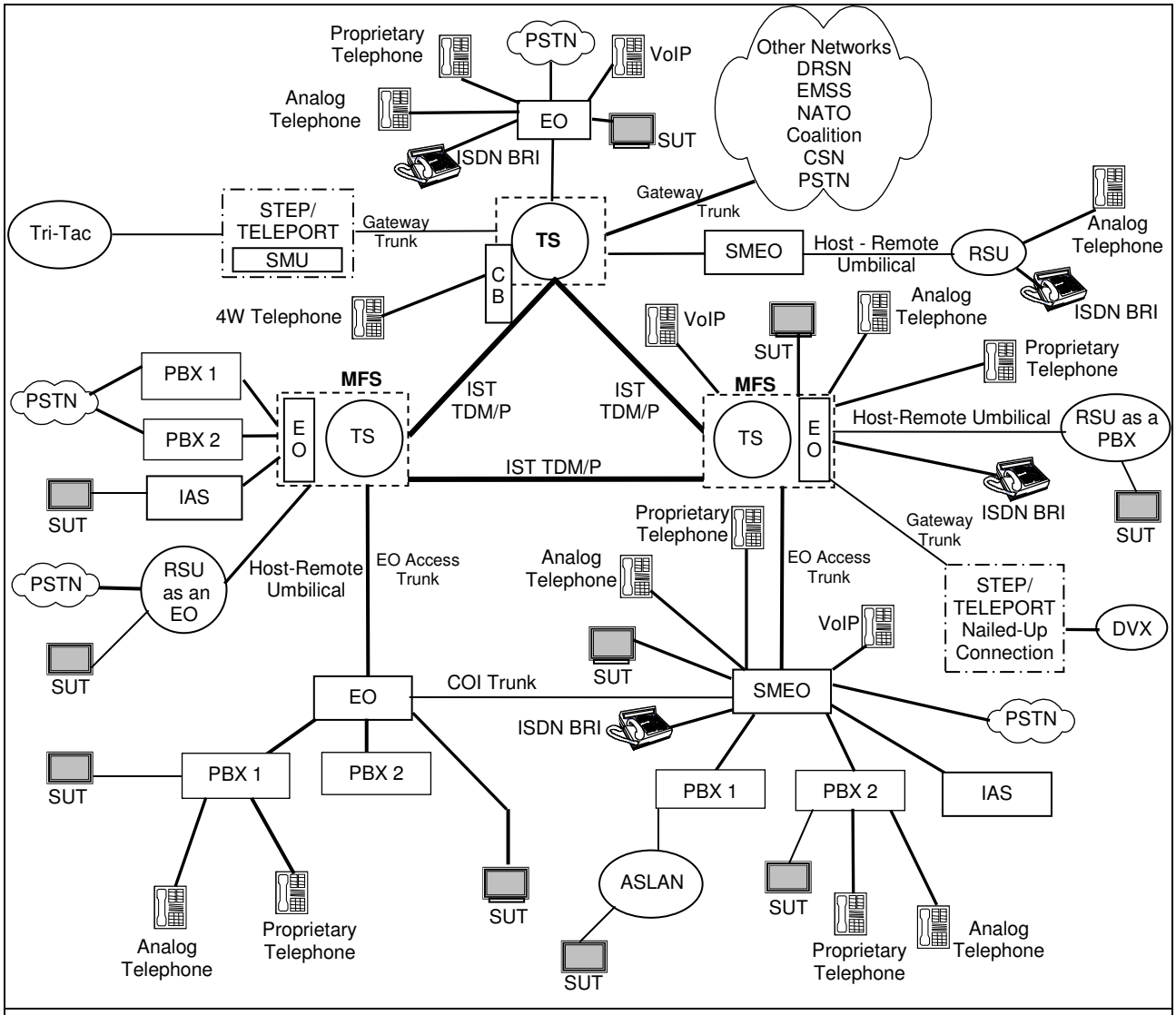
5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a network appliance that provides multi-site Video Teleconferencing (VTC) capabilities. The primary function is to serve as a bridge to allow multiple endpoints such as codecs and other VTC units to communicate in a single call. The SUT supports endpoints using International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) H.323 or ITU-T H.320. The MPS solution may be managed by the Tandberg Management Suite (TMS) server. The TMS server is a centralized management solution to make configuration changes, give the ability to schedule teleconferences, monitor the status of current VTC units, and perform maintenance on the MPS series. The MPS series is certified with or without the TMS.

The SUT supports the following features which were met through testing or vendor submission of Letters of Compliance (LoC) unless otherwise noted:

- Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) and Primary Rate Interface (PRI), Digital Transmission Link Level 1 (T1), or European Basic Multiplex Rate (E1), and ITU-T H.320
- Network Interfaces: ISDN PRI T1 or E1, 10/100/1000 auto network interface card
- Standards: ITU-T H.320 up to 2 Megabits per second (Mbps)
- ITU-T H.323 up to 4 Mbps point-to-point (pt-to-pt), Session Initiation Protocol (SIP) up to 4 Mbps (not tested and not certified)
- Audio standards: ITU-T G.711, ITU-T G.722, ITU-T G.722.1, ITU-T G.728, MPEG4 AAC-LD
- Video standards: ITU-T H.261, ITU-T H.263, ITU-T H.263++, ITU-T H.264, ITU-T H.239, ITU-T H.241
- Multi-Control Point compatibility ITU-T H.243, ITU-T H.231, ITU-T H.221, ITU-T H.224/H.281
- Inverse Multiplexing ITU-T H.244
- Echo Cancellation, Adaptive Post Filtering, Automatic Gain Control, Automatic Noise Suppression
- Video formats supported: National Television Standards Committee, Phase Alternate Line, Video Graphics Array, Super Video Graphics Array, Extended Graphics Array

- Up to 160 Multipoint Control Unit (MCU) video ports, up to 48 MCU audio ports, up to 80 gateway sessions, up to 128 serial interface ports, and up to 32 ISDN PRI ports.

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) Defense Switched Network (DSN) architecture in Figure 2-1 depicts the relationship of the SUT to the DSN switches.



LEGEND:

4W	4-Wire
BRI	Basic Rate Interface
CB	Channel Bank
COI	Community of Interest
CSN	Canadian Switch Network
DRSN	Defense Red Switch Network
DSN	Defense Switched Network
DVX	Deployable Voice Exchange
EMSS	Enhanced Mobile Satellite System
EO	End Office
ISDN	Integrated Services Digital Network
IST	Interswitch Trunk
MFS	Multifunction Switch
NATO	North Atlantic Treaty Organization
PBX	Private Branch Exchange
PBX 1	Private Branch Exchange 1
PBX 2	Private Branch Exchange 2
PSTN	Public Switched Telephone Network
RSU	Remote Switching Unit
SMEO	Small End Office
SMU	Switched Multiplex Unit
STEP	Standardized Tactical Entry Point
SUT	System Under Test
TDM/P	Time Division Multiplex/Packetized
Tri-Tac	Tri-Service Tactical Communications Program
TS	Tandem Switch
VoIP	Voice over Internet Protocol

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in Table 2-1. These requirements are derived from the UCR, 5.2.12.4, Interface and Functional Requirements and verified through JITC testing and review of vendor's LoC.

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	UCR Reference
IP (10/100 Mbps) ITU-T H.323	No [1]	Yes[2]	The VTC system/endpoints shall meet the requirements of FTR1080B-2002 (R)	Met	5.2.12.4.5
			ITU-T H.323 in accordance with FTR 1080B-2002 (C)	Met	5.2.12.4.5
			Layer 3 Differential Service Code Point tagging as specified in UCR, 5.2.12.8.2.9 (C)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics shall not degrade or impair switch and associated network operations (R)	Met	5.2.12.4.5
ISDN PRI T1 ISDN PRI E1	No [1]	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Integrated PRI interface shall be in conformance with IAS requirements in UCR, 5.2.12.7 (IAS) (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	5.2.12.4.5
Serial Interfaces[3]: EIA-366A EIA-449 EIA-530 ITU-T V.35[4]	No [1]	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	5.2.12.4.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	5.2.12.4.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, 5.2.12.3 (CPE) (C)	Met	5.2.12.4.5
			Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (C)	Met	5.2.12.4.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	5.2.12.4.5
	Yes	Certified	Security (IA/DIACAP) (R)	See note 5.	3.2.3

Table 2-1. SUT Functional Requirements and Interoperability Status (continued)

NOTES:

1 The VTC system interface requirements can be met with ISDN PRI, Serial, or ITU-T H.323 interface.

2 The SUT met the requirements for the ITU-T H.323 interface standard; however, Assured Service is not yet defined for the ITU-T H.323 interface. Since ITU-T H.323 interfaces do not provide Assured Services during a crisis or contingency, users' access to the DSN will be on a best effort basis. Therefore, C2 VTC users and Special C2 VTC users are not authorized to be served by an ITU-T H.323 interface.

3 The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the Unified Capabilities (UC) Approved Products List (APL).

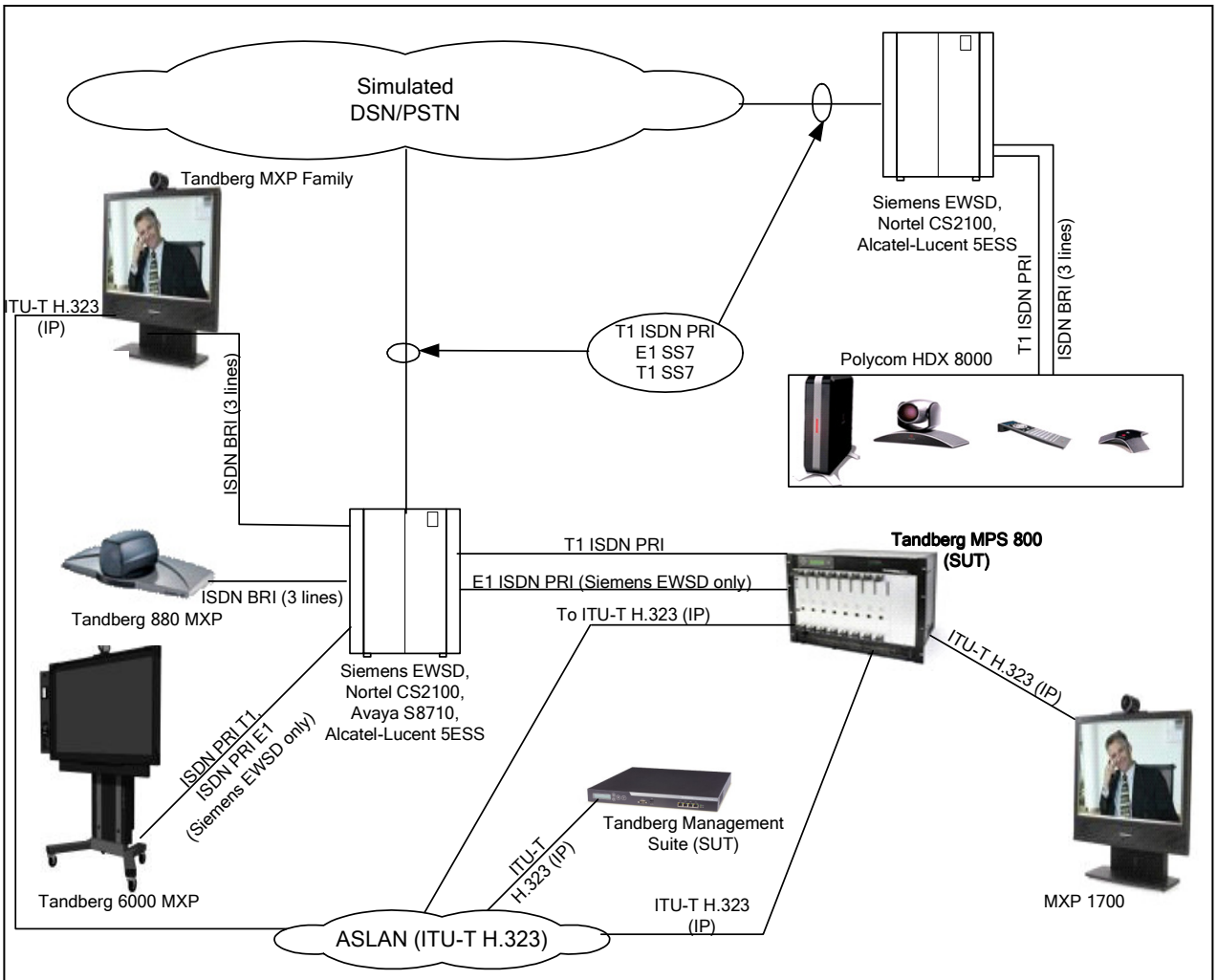
4 The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.

5 Security is tested by DISA-led Information Assurance test teams and published in a separate report, reference (e).

LEGEND:

C	Conditional	IAS	Integrated Access Switch
C2	Command and Control	ISDN	Integrated Services Digital Network
CPE	Customer Premise Equipment	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
DCE	data circuit-terminating equipment	kbps	kilobits per second
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	kHz	kiloHertz
DISA	Defense Information Systems Agency	Mbps	Megabits per seconds
DSN	Defense Switched Network	PRI	Primary Rate Interface
DTE	data terminal equipment	R	Required
E1	European Basic Multiplex Rate (2.048 Mbps)	SUT	System Under Test
EIA	Electronic Industries Alliance	T1	Digital Transmission Link Level 1 (1.544 Mbps)
EIA-366A	Standard for interface between DTE and automatic calling equipment for data communication	TA	Terminal Adapter
		UCR	Unified Capabilities Requirements
EIA-449	Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
		V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
FTR	Federal Telecommunications Recommendation		
H.320	Standard for narrowband VTC		
H.323	Standard for multi-media communications on packet-based networks	VTC	Video Teleconferencing
		VTU	Video Teleconferencing Unit
IA	Information Assurance		

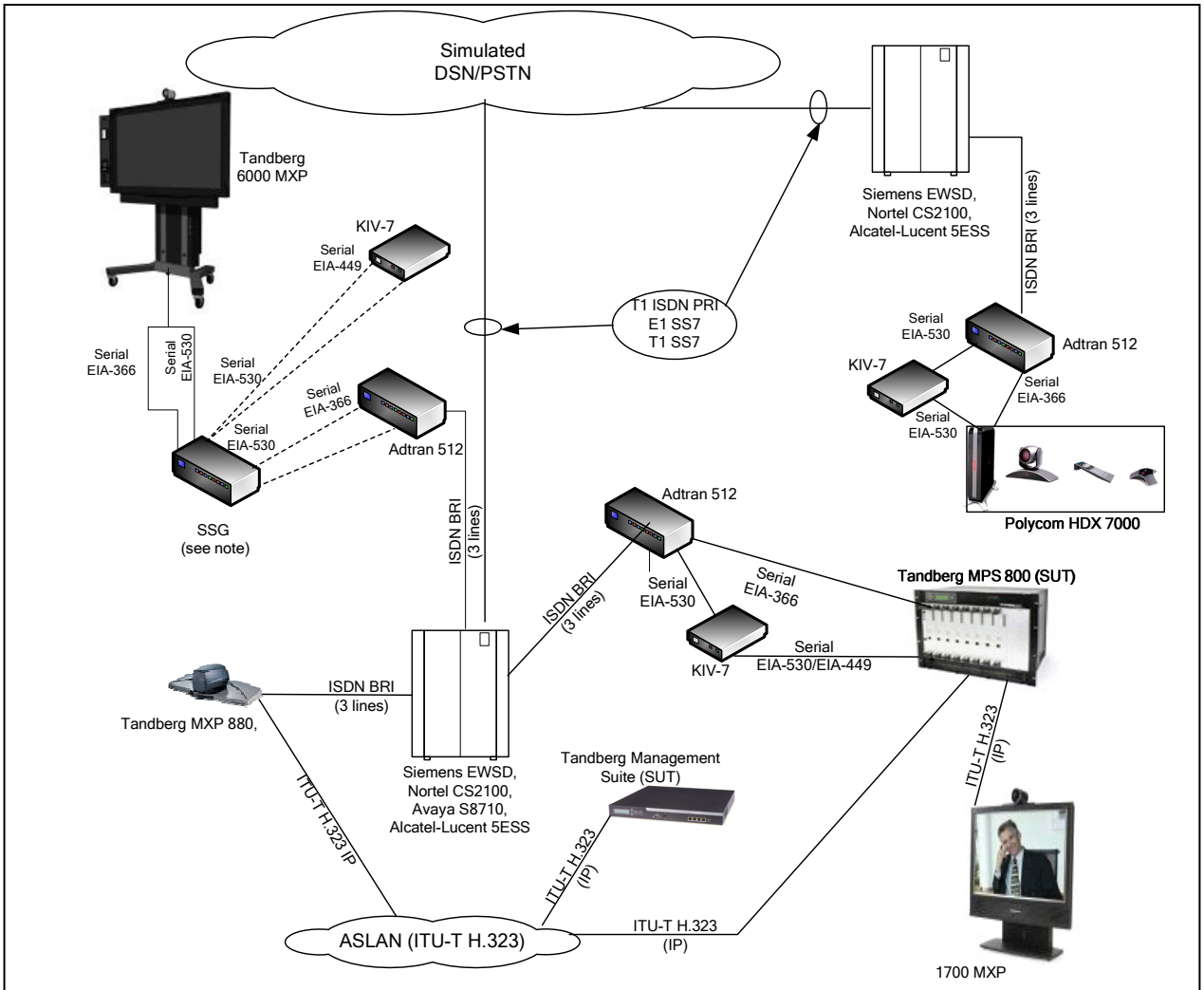
8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility (GNTF) in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in Figures 2-2 through 2-4.



LEGEND:

5ESS	Class 5 Electronic Switching System
BRI	Basic Rate Interface
CODEC	Coder/Decoder
CS	Communication Server
DSN	Defense Switched Network
E1	European Basic Multiplex Rate (2.048 Mbps)
EWSD	Elektronisches Wählsystem Digital
H.323	Standard for multi-media communications on packet-based networks
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
Mbps	Megabits per second
MPS	Media Processing System
MXP	Media Experience
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
SS7	Signaling System 7
SUT	System Under Test
T1	Digital Transmission Link Level 1 (1.544 Mbps)
TMS	Tandberg Management Suite

Figure 2-2. SUT ISDN PRI and BRI Test Configuration

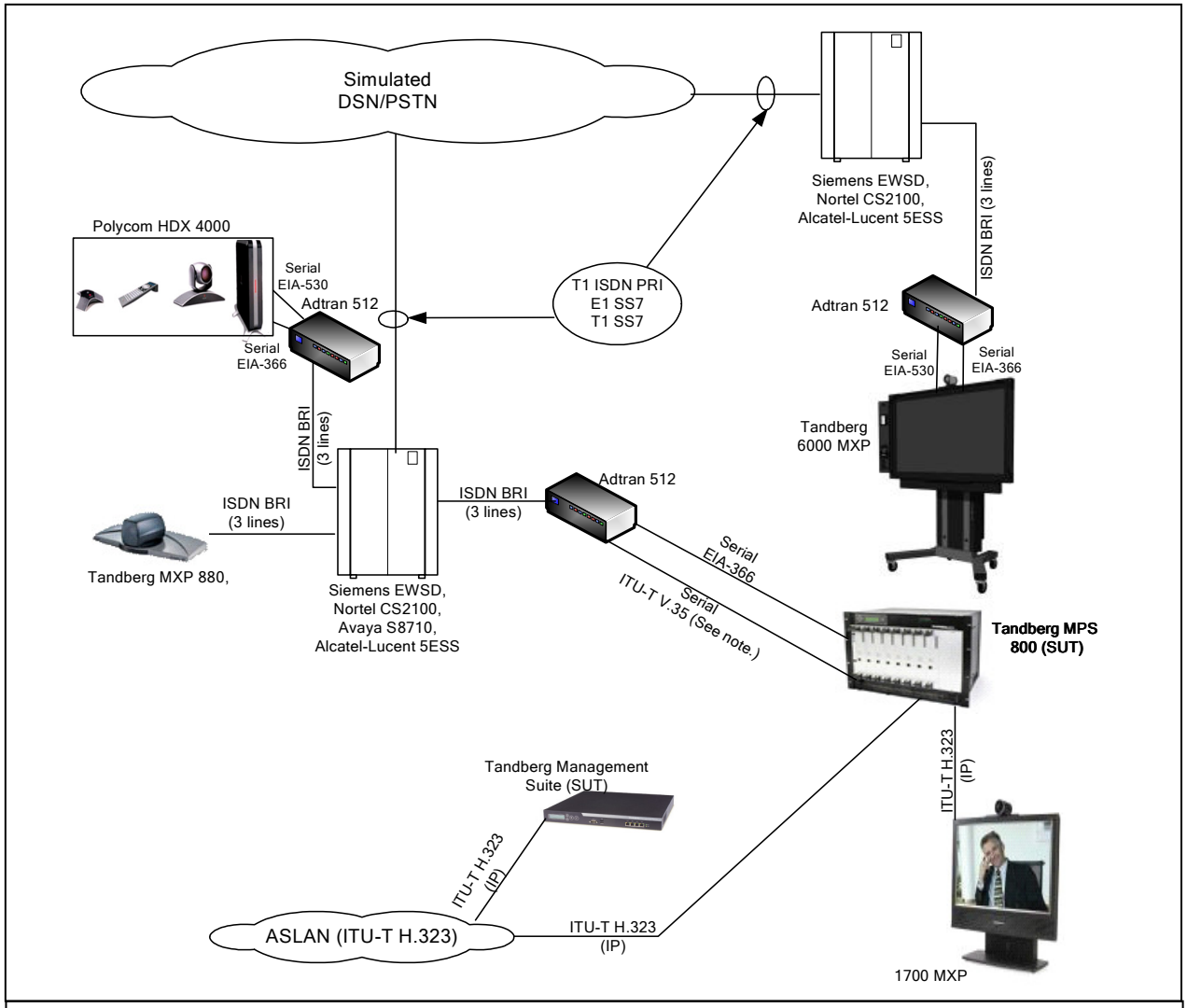


NOTE: The 6000 MXP can be configured with an SSG as depicted, or without by directly connecting to the KIV-7 and Adtran 512

LEGEND:

5ESS	Class 5 Electronic Switching System
BRI	Basic Rate Interface
CODEC	Coder/Decoder
CS	Communication Server
DCE	data circuit-terminating equipment
DSN	Defense Switched Network
DTE	data terminal equipment
E1	European Basic Multiplex Rate (2.048 Mbps)
EIA	Electronic Industries Alliance
EIA-366A	Standard for interface between DTE and automatic calling equipment for data communication
EIA-449	Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange
EWSD	Elektronisches Wählsystem Digital
H.323	
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
Mbps	Megabits per second
MXP	Media XPerience
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
SS7	Signaling System 7
SUT	System Under Test
T1	Digital Transmission Link Level 1 (1.544 Mbps)
SSG	Secure Systems Group

Figure 2-3. SUT Serial with Encryption Test Configuration



NOTE: The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.

LEGEND:

5ESS	Class 5 Electronic Switching System
BRI	Basic Rate Interface
CODEC	Coder/Decoder
CS	Communication Server
DCE	data circuit-terminating equipment
DSN	Defense Switched Network
DTE	data terminal equipment
E1	European Basic Multiplex Rate (2.048 Mbps)
EIA	Electronic Industries Alliance
EIA-366A	Standard for interface between DTE and automatic calling equipment for data communication
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange
EWSD	Elektronisches Wählsystem Digital
HDX	High Definition Experience
ISDN	Integrated Services Digital Network
kbps	kilobits per second
kHz	kiloHertz
Mbps	Megabits per second
MXP	Media XPerience
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
SS7	Signaling System 7
SUT	System Under Test
T1	Digital Transmission Link Level 1 (1.544 Mbps)
V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits

Figure 2-4. SUT ITU-T V.35 Serial Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations, hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-2. Table 2-2 lists the DSN switches which depict the tested configuration and is not intended to identify the only switches that are certified with the SUT. The SUT is certified with switching systems listed on the Unified Capabilities (UC) Approved Products List (APL) that offer the same certified interfaces.

Table 2-2. Tested System Configurations

System Name		Software Release
Siemens EWSD		19d with Patch Set 46
Nortel CS2100		Succession Enterprise (SE)09.1
Avaya S8710		Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)
Alcatel-Lucent 5ESS		5E16.2, Broadcast Warning Message (BWM) 07-0003
Adtran 512 IMUX		Firmware Version CS.0, Cksum10b2
Adtran 512 IMUX		Firmware Version F.00, Cksum2d44
Tandberg 6000 MXP		F7.1.1 NTSC
Tandberg 880 MXP		F2.3 NTSC
Tandberg MXP Family (6000 MXP, 3000 MXP, 1000 MXP, Edge 95 MXP, and the 1700 MXP)		F7.3.1
Polycom HDX Family (HDX 8000, HDX 7000, and the HDX 4000)		2.0.5_J
Secure Systems Group (SSG) VSW 431		Firmware revision C
SUT (See note.)	**Tandberg MPS 800** Tandberg MPS 200	J4.5
	Tandberg Management Suite	TMS v.12

NOTE: Components bolded and underlined were tested by JITC. The other components in the family series were not tested; however, they utilize the same software and hardware and JITC analysis determined them to be functionally identical for interoperability certification purposes and they are also certified for joint use.

LEGEND:

5ESS	Class 5 Electronic Switching System	JITC	Joint Interoperability Test command
CODEC	coder/decoder	MPS	Media Processing System
CS	Communication Server	MXP	Media Experience
EWSD	Elektronisches Wählsystem Digital	NTSC	National Television Standards Committee
IMUX	Inverse Multiplexer	SUT	System Under Test

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion. The SUT minimum critical interoperability interface and functional requirements were met through both interoperability certification testing conducted at the JITC GNTF and review of the vendor's LoC. Bonding mode 1 was tested to requirements defined in UCR, 5.2.12.4.5 and Federal Telecommunications Recommendation 1080B-2002. Bonding, often referred to as channel aggregation, takes place through inverse multiplexing. Inverse multiplexing takes a high-bandwidth signal and splits it for transport through the network over multiple lower-bandwidth channels. At the receiving end, the multiple, lower-bandwidth signals are recombined

into the original high-bandwidth signal. A passed test result was based on 100 percent of the calls receiving a score of four or better on the subjective quality scale as defined in Table 2-3.

Table 2-3. Video and Voice Subjective Quality Scale

Rating	Reference	Definition
1	*Unusable*	Quality is unusable. Voice and video may be heard and seen but is unrecognizable.
2	*Poor*	Quality is unusable. Words and phrases are not fully understandable or video cannot be properly identified.
3	*Fair*	Quality is seriously affected by distortion. Repeating words and phrases are required to convey speech or video is seriously impacted and barely recognizable.
4	***Good***	**Quality is usable. Audio or video is not impaired but some distortion is noticeable**
5	*Excellent*	Quality is unaffected. No discernable problems with either audio or video.
NOTE: Audio and video quality during a conference will receive a subjective rating on the Data Collection Form. A rating of lower than 4 on this reference scale is considered a failure.		

b. Test Conduct. Multiple two-way 112 - 384-kbps bonding mode 1 Multipoint and Point-to-Point test calls at different durations (15-minute, 30-minute, 1-hour, 24-hours, and 48-hours) were placed over the test network shown in Figure 2-2 via all the combinations depicted in Table 2-1. The Multipoint and Point-to-Point bonding mode 1 VTC test calls were placed at various precedence levels over the test configurations depicted in Figures 2-2 through 2-4.

Seven- and ten-digit calls were placed to verify that the SUT met the capability to support both the North American Numbering Plan and the DSN World Wide Numbering and Dialing Plan (WWNDP) defined in UCR, 5.2.12.4.5. Multilevel precedence video calls were placed from the SUT and established within the DSN at the respective precedence level dialing the DSN WWNDP access code. The SUT was also tested with secure video sessions using a KIV-7 Communications Security (COMSEC) device as shown in Figure 2-3. Table 2-4 provides the KIV-7 COMSEC device configuration settings.

Table 2-4. COMSEC Configuration

KIV-7 HSB Serial Number	KIV-7 HSB SETUP Storage Location	Channel ID/Description	Date
	[x] STO 1 [ ] STO2 [ ] STO3	OC-256 KIV-7 HSB Setup	12-16-04

Setup ABCD	Setup Item	Options (Check the box to the left of the selected option. The highlighted box [x] indicates the setting during test)
[-SETUP A]	[=ClkSel]	[ ]MASTER **[X]SLAVE** [ ]STA CLK [ ]TT SEL1 [ ]TT SEL2
	[=SyncSel]	**[X] RED** [ ] RED-as [ ] NR [ ] NR-as [ ] OP2 [ ] ACT1 [ ] ACT2 [ ] HF [ ] HF-as [ ] EXT [ ]EXT-as
	[=CommSel]	**[X] FDX** [ ] FDX Ind [ ] TX only [ ] RX only [ ]SPLX 2W [ ] SPLX 4W
	[=DataMod]	[ ] BB cond **[X] BB** [ ] DP [ ] DP cond
	[=DataLen]	**[X] Synch/S** [ ] Synch/A [ ] 7 bits [ ] 8 bits [ ] 10 bits [ ] 11 bits
	[=TX Rate]	[ ] 50 [ ] 75 [ ] 100 [ ] 110 [ ] 150 [ ] 200 [ ] 220 [ ] 300 [ ] 600 [ ] 1.2k [ ] 2.4k [ ] 4.8k [ ] 8.0k [ ] 9.6k [ ] 14.4k [ ] 16k [ ] 19.2k [ ] 28.8k [ ] 32k [ ] 38.4k [ ] 57.6k [ ] 64k [ ] 115.2k [ ] 128k [ ] 192k [ ] 288k [ ] EXT 32x **[X] EXT DRC**
	[=RX Rate]	[ ] 50 [ ] 75 [ ] 100 [ ] 110 [ ] 150 [ ] 200 [ ] 220 [ ] 300 [ ] 600 [ ] 1.2k [ ] 2.4k [ ] 4.8k [ ] 8.0k [ ] 9.6k [ ] 14.4k [ ] 16k [ ] 19.2k [ ] 28.8k [ ] 32k [ ] 38.4k [ ] 57.6k [ ] 64k [ ] 115.2k [ ] 128k [ ] 192k [ ] 288k [ ] EXT 32x **[X] EXT DRC**
	[=TTY Mode]	**[X] Auto** [ ] Manual [ ] Unframd [ ] SPLXint [ ] SPLXext
	[=I/Fctrl]	[ ] OFF **[X] PTRS** [ ] RS&CS **[X]CTCS** [..] PTTR [..] CTRR [..] CTDM **[X] Resync Level**
[-SETUP B]	[=Invert]	[ ] BLKdata [ ] REDdata [ ] SyncTX [ ] SyncRX [x] NONE
	[=TXClock]	**[X] contTXC** [ ] gateTXC
	[=RXClock]	**[X] contRXC** [ ] gateRC
	[=SyncOOS]	[ ] Enabled **[X] Disabled**
	[=IdleSel]	[ ] Enabled **[X] Disabled**
	[=AutoPhs]	**[X] OFF** [ ] ON 2s [ ] ON 5s [ ] ON 10s [ ] ON 15s
	[=UpdateU]	**[X] Enabled** [ ] Disabled [ ] Clock Lock
[-SETUP C]	[=RED I/F]	[ ] RS-232 **[X] EIA-530** [ ] 422/423
	[=BLK I/F]	[ ] RS-232 **[X] EIA-530** [ ] 422/423
	[=FIL I/F]	**[X] 102/Std** [ ] 102/Tag [ ] 101/Std [ ] 101/Tag
	[=FILaddr]	**254** Record selected address 1 – 254. Default is 254
	[=RCUaddr]	**31** Record selected address 1 – 31. Default is 31
	[=Display]	[ ] High **[X] Medium** [ ] Low
	[=Speaker]	**[X] Enabled** [ ] Disabled
[-SETUP D]	[=Algorithms]	[ ] Master **[x] Slave** Algorithm **[x] ALG1**
[-SEL KEY]		**[x] X01** [ ] X02 [ ] X03 [ ] X04 [ ] X05 [ ] X06 [ ] X07 [ ] X08 [ ] X09 [ ] X10

Notes:

Table 2-4. COMSEC Configuration (continued)

LEGEND:

ACT1	Asynchronous cipher text to 288 kbps
ACT2	Asynchronous cipher text to 288 kbps
as	anti-spoof
Auto	Automatic
Autophs	Autophasing Select
BB	Baseband
BB cond	Baseband conditioned
BLK	Invert Black
BLKdata	Invert black data
ClkSel	Clock Select
CommSel	Communication Select
ContRXC	Continuous receive clock
ContTXC	Continuous transmit clock
CTCS	Cipher text clear to send
CTDM	Cyper Text Data Mode
CTRR	Cipher text receiver ready
DataLen	Data Length
DataMod	Data Mode
DP	Diphase
DP Cond	Conditioned Diphase
EIA	Electronic Industries Alliance
EIA-530	Standard for 25-position interface for data terminal equipment and automatic calling equipment for data communications
EXT	External
EXT DRC	External Data Rate Clock
FDX	Full duplex
FDX Ind	Full duplex independent transmit and receive
FIL	Fill
FILaddr	Fill address select
gateRC	Gated continuous receive clock
gateTXC	Gated continuous transmit clock
HF	High Frequency
HSB	High Speed Bravo model
I/F	Interface
I/Fctrl	Interface control
ID	Identification
IdleSel	Idle Select
kbps	kilobits per second
NR	Non-Redundant
OC	Outpost Communicator
OP2	Operational Mode 2
PTRS	Plain text request-to-send
PTTR	Plain text terminal ready
RCUaddr	Remote control address select
RED	Redundant (listed under setup A)
RED-as	Redundant anti-spoof
REDdata	RED (encrypted) (listed under Setup B)
RED I/F	RED (encrypted) interface (listed under Setup C)
Resync	Resynchronization
RS&CS	Ready to Send & Clear to Send
RS-232	Recommended standard 232
RX	Receive
RXClock	Receive Clock
RX Rate	Receive rate
s	Second
SPLX 2W	Simplex 2-Wire
SPLX 4W	Simplex 4-Wire
SPLXext	Simplex external
SPLXint	Simplex internal
STA CLK	Station Clock
Std	Standard
STO	Store
Synch/A	64 characters, asynchronous 10-bit
Synch/S	512 bits, Synchronous
SyncOOS	Synchronization Out of Sync detect signal
SyncRX	Invert Synchronization receive control signal
SyncSel	Synchronization Select
SyncTX	Invert Synchronization Transmit control signal
TT SEL1	Terminal Timing Selection 1
TT SEL2	Terminal Timing Selection 2
TTY	Teletype
TX	Transmit
TX Clock	Transmit Clock
TX Rate	Transmit rate
Unframd	Frame transmit, but no receive
UpdateU	Update Unique variable
X01	Cryptographic traffic key position
X02	Cryptographic traffic key position
X03	Cryptographic traffic key position
X04	Cryptographic traffic key position
X05	Cryptographic traffic key position
X06	Cryptographic traffic key position
X07	Cryptographic traffic key position
X08	Cryptographic traffic key position
X09	Cryptographic traffic key position
X10	Cryptographic traffic key position

The UCR, 5.2.12.4.5 requirements state:

(1) The VTC system/endpoints shall meet the requirements of FTR 1080B-2002. The SUT met this requirement through testing and the vendor's LoC.

(2) A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference. This was tested during each multipoint session established with the SUT by disconnecting single and multiple conferees. This was done by hanging up and simulating a failure by disconnecting the physical interface. 100 percent of the time during the test, the remaining conferees on the multipoint conference were not affected and remained in the conference.

(3) An audio add-on interface, implemented independently of an Integrated Access Switch (IAS), shall be in accordance with the UCR, 5.2.12.3. The SUT met this requirement through testing and the vendor's LoC.

(4) A VTC system/endpoint that uses an integrated BRI interface to connect to the DSN shall be in conformance with the requirements associated with a Terminal Adaptor (TA) as described in the UCR, 5.2.12.3. The SUT met this requirement through testing and the vendor's LoC.

(5) VTC features and functions used in conjunction with IP network services shall meet the requirements of H.323 in accordance with FTR 1080B-2002. Additionally, H323 Video EIs must meet the tagging requirements as specified in UCR 2008, Section 5.2.12.8.2.9, VoIP System Service Class Tagging Requirements. This requirement was met by the SUT. The SUT has the ability to apply a Service Class Tag for signaling and video media at any value 0 to 63.

(6) A VTC system/endpoint that uses an integrated PRI interface to connect to the DSN shall be in conformance with the requirements associated with an IAS as described in the UCR, 5.2.12.7. The SUT met this requirement through testing and the vendor's LoC.

(7) A VTC system/endpoint that uses a serial interface(s) to another device, such as a cryptographic device, IAS, or TA, for eventual connection to the DSN, shall be in conformance with the requirements for that serial interface(s) as described in FTR 1080B-2002. The SUT met this requirement through testing and the vendor's LoC.

(8) The physical, electrical, and software characteristics of Video Teleconferencing Unit system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. This was tested by conducting other tests on the serving DSN switch to include bulk call loading while point-to-point and multipoint video sessions were established. 100 percent of the time during the test, the SUT physical, electrical, and software characteristics did not impair the serving DSN switch and its associated operations.

c. Test Summary. The SUT met the critical interface and functional requirements for a VTC system for the interfaces depicted in Table 2-1, as set forth in reference (c), and is certified for joint use within the DSN. The SUT met the requirements for an IP interface with the ITU-T H.323 protocol; however, Assured Service is not yet defined for an IP interface with the ITU-T H.323 with the protocol. Since the IP interface with the ITU-T H.323 protocol does not provide Assured Services during a crisis or contingency, users' access to the DSN will be on a best effort basis. Therefore, C2 VTC users and Special C2 VTC users are not authorized to be served by an IP interface with the ITU-T H.323 protocol. The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA, which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the UC APL.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) System, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at ttp://jit.fhu.disa.mil (NIPRNet), or http://199.208.204.125 (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.